AMINO ACID ANALYSIS: HYDROLYSIS, COLOR REAGENT, AND SENSITIVITY

by

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INTRODUCTION

Automated ion-exchange chromatography is today the most widely used method for amino acid determinations. There have been improvements in resin technology and instrumentation, but research is still needed to improve current techniques.

One major detection problem is proline quantification. Proline, an imino acid, reacts with ninhydrin to yield a yellow colored compound instead of the purple complex that is formed by the reaction of the α-amino acids. The yellow color has an absorbance maximum that is different from the purple complex. One objective of this study was to develop a color reagent that will allow detection of both imino and α-amino acids at one wavelength.

There is increasing demand for more sensitive detection of amino acids. Analysis of very low levels of amino acids is of particular importance in specialized research where amino acids and proteins occur in low concentrations. A portion of this study was devoted to the development of methods to optimize color yield and thereby increase analyzer sensitivity.

Another important step in amino acid analysis is hydrolysis. Hydrolysis with HCl is the most common method used. Alternate hydrolysis methods need to be investigated for routine analysis of food and feed samples. The third portion of this study was timed hydrolysis of a cereal product to compare HCl and p-toluenesulfonic acid hydrolysates efficacy and amino acid destruction.